Terms of Reference

for a rulemaking task

TAWS operation in IFR and VFR and TAWS for turbine-powered aeroplanes under 5 700 kg MTOM able to carry 6 to 9 passengers

RMT.0371 & RMT.0372 (OPS.078(a) & (b)) — ISSUE 1 — 31.1.2014

Applicability		Process map	
Affected regulations and decisions:	Annexes III and IV to Commission Regulation (EU) No 965/2012 ED Decisions 2012/017/R and 2012/018/R	Rulemaking lead:	R3
		Concept Paper:	No
		Rulemaking group:	Yes
		RIA type:	Full
Affected stakeholders:	CAT, NCC, NCO, SPO Operators and NAAs	Technical consultation during NPA drafting:	No
		Publication date of the NPA:	2014/Q4
Driver/origin:	Safety (safety recommendations ITAL-2009-001,FRAN-2009-009 and SPAN-2012-010)	Duration of NPA consultation:	3 months
		Review group:	Yes
		Focussed consultation:	No
Reference:	ICAO Annex 6 Part I and II French BEA accident investigation report No v2-I080628 Italian ANSV accident investigation report (OE-FAN 24/02/2004) Spanish CIAIAC accident investigation report No A-07/1998	Publication date of the Opinion:	2016/Q4
		Publication date of the Decision:	2017/Q4

1. Issue and reasoning for regulatory change

A Terrain Awareness and Warning System (TAWS) aims to prevent Controlled Flight Into Terrain (CFIT) accidents, where a properly functioning airplane under the control of a fully qualified and certificated crew is flown into terrain (or water or obstacles) with no apparent awareness on the part of the crew. TAWS has contributed to a significant reduction in the rate of accidents categorised as CFIT.

Issue No 1:

The first issue is related to the lack of TAWS requirements for turbine-engined aeroplanes operated in commercial air transport with a Maximum Take-Off Weight (MTOW) of less than 5 700 kg and with a Maximum Operational Passenger Seating Configuration (MOPSC) of more than 5 and not more than 9.

Indeed, Annex IV to Commission Regulation (EU) No 965/2012 only requires this equipment for turbine-powered aeroplanes having a Maximum Certificated Take-Off Mass (MCTOM) of more than 5 700 kg or an MOPSC of more than 9 and reciprocating engine-powered aeroplanes with an MCTOM of more than 5 700 kg or an MOPSC of more than 9.

It should be noted, nevertheless, that the International Civil Aviation Organization (ICAO) recommends (Annex 6, Part I, paragraph 6.15.5) that 'All turbine-engined aeroplanes of a maximum certificated take-off mass of 5 700 kg or less and authorized to carry more than 5 but not more than 9 passengers should be equipped with a ground proximity warning system which provides the warnings of 6.15.8 a) and c), warning of unsafe terrain clearance and a forward looking terrain avoidance function'. A similar provision exists in Annex 6 Part II (cf. paragraph 2.4.11.2) for non-commercial operations. These provisions have not been introduced so far in the European rules.

No such provision has been inserted so far in Annex 6 Part III, although the related risk also exists for helicopters. For those aircraft, the issue is more complex, since their related operations often imply flying close to the terrain. Actually, some other mitigating measures already exist (e.g. AVAD for offshore operations).

In addition, it should be noted that this issue is part of the European Aviation Safety Programme, under action item AER3.6.

Following a fatal accident which occurred to a Cessna C 550 on 24 February 2004, operated in CAT, the Agenzia Nazionale per la Sicurezza del Volo (ANSV) recommended to the Agency through safety recommendation No ITAL-2009-001 to require such systems also for turbine-powered aeroplanes with an MTOW of less than 5 700 kg and with a MOPSC of more than 5 and not more than 9.

According to the investigation report, this accident, classified as CFIT, was caused by the conduct of the flight at a height significantly below the Area Minimum Altitude, insufficient to maintain the separation from the ground during a night visual approach in the absence of adequate visual reference.

The accident report states in particular that the accident would have had a minor probability of occurrence, would the aeroplane be equipped with such a system, which is not required for this type of aircraft in the current applicable regulation.

A similar recommendation No SPAN-2012-010 was issued in 2002 and then forwarded to the Agency in 2012. This recommendation was issued following a fatal accident which occurred in Barcelona on 18 February 1998. In this case, the report referenced A-07/1998 stated that the accident was likely caused by establishing an improper descent angle in

reduced visibility operations combined with possible crew fatigue. As for the first accident mentioned above, the report stated as well that a TAWS would have reduced the probability of occurrence.

The estimated cost of a TAWS system is around EUR 15 000 and very few aeroplanes (around 10 %) would be affected.

Issue No 2:

TAWS warnings have proven to be an effective mitigation to CFIT accidents, however, they rely on correct flight crew response, up-to-date terrain databases and software, and on a source of position information feeding into them.

Indeed, even with a TAWS installed, several factors can still place aircraft at risk for CFIT accidents: outdated software/database, deactivation of the TAWS system, ignoring TAWS warnings or inappropriate response to such warnings.

The second issue is related to the lack of confidence of some flight crews towards the TAWS due to its use in both Visual Flight Rules (VFR) and Instrument Flight Rules (IFR). Indeed, when flying in VFR, pilots both receive the TAWS warnings and see the obstacles and, therefore, they might in some occasion consider, based only on visual information, that they still clear the obstacles with an important margin even when the TAWS produces a warning. When flying in IFR, this could lead some pilots not to respond appropriately to a TAWS warning since they could consider that the TAWS is not accurate and that some margin is still available to clear the obstacles.

A CAA UK study of operators has revealed that TAWS systems produce seven times more false and nuisance warnings than genuine hard warnings (See UK FODCOM 06/2007). This study followed research by the Flight Safety Foundation (FSF) and ICAO, which showed that pilots often delay reacting to TAWS warnings.

Following an incident which occurred on 28 June 2008 and during which a DHC6 aircraft descended under the Minimum Sector Altitude (MSA) to avoid flying in an active cloud while performing an Instrument Landing System (ILS) approach to Pointe-a-Pitre airport, the French BEA recommended to the Agency through safety recommendation No FRAN-2009-009 to require operators to develop a policy and procedures for the use of TAWS dependant on the flying rules (IFR/VFR).

Indeed, the French BEA considered that even if no TAWS malfunction or misuse has been identified during the investigation, TAWS is, nevertheless, assumed by some pilots to generate many false alarms and, thus, is not considered reliable. This is especially relevant for VFR flight with no immediate safety case and this is why, according to the French BEA, pilots do not have always the appropriate reaction to a TAWS alarm under IFR since they do not trust it.

In the current regulatory framework, Commission Regulation (EU) No 965/2012 requires in AMC3 ORO.MLR.100, related to the content of the operations manual, operators to develop procedures for the use of TAWS in the Operations Manual but without any distinction between IFR and VFR.

2. Objectives

The general objective is to maintain a uniform and high safety level with cost-efficient rules.

The specific objectives are:

— the validation of the need for a regulatory requirement for TAWS to be installed in turbine-powered aeroplanes of less than 5 700 kg MTOW and with an MOPSC of more than 5 regardless of being operated commercially or not, and

— the improvement of the TAWS efficiency in reducing CFIT.

3. Activities

During the development of the draft rules and the RIA, the following activities will be considered:

— Assessment of the number of concerned aeroplanes, of the accidents of these aeroplanes and of the potential safety benefits of TAWS;

— Assessment of the costs related to the fitting or retrofitting of TAWS on the concerned aeroplanes;

— Assessment of some AIB reports to draw conclusions from false warnings and possibly wrong pilot reactions and propose guidance on correct pilot actions in such cases;

— Assessment of the current requirements related to the use of TAWS in terms of procedures and training; and

— Drafting of new requirements to address the safety issues. Regarding the new requirement for the installation of TAWS, the following options will have to be assessed based on the decision on the implementation options (i.e. forward fit and retrofit of the system on the aeroplanes concerned):

  - Amendment of the appropriate certification specification which would affect applications for newly designed types or models;
  - Amendment of Part 26 mandating 'forward fit' (i.e. implementation by manufacturers on newly produced aeroplanes based on existing TCs); and
  - Amendment of Part CAT, Part NCC, Part NCO and Part SPO mandating operators to retrofit or forward fit all the concerned aeroplanes within an appropriate timeframe.

The task will take due account of the General Aviation strategy and the different target levels of safety and risk tolerance that should be applied to stakeholders involved in General Aviation.

4. Deliverables

RMT.0371/0372 will deliver a proposal to introduce regulatory changes:

— NPA containing the amendments to one or more of the following regulatory texts:

  - CS-23;
  - Part 26;
  - Part ORO and related AMC/GM;
  - Part CAT and related AMC/GM;
  - Part NCC and related AMC/GM;
  - Part NCO and related AMC/GM; and
  - Part SPO and related AMC/GM.

— Opinion containing the new/amended implementing rules;

— ED Decisions containing the new/amended AMC/GM.

5. Profile and contribution of the rulemaking group

Members of rulemaking groups are appointed by the Agency's Rulemaking Director in accordance with the provisions of the Rulemaking Procedure[1].

The rulemaking group related to this task should include representatives from:

(a) operators;

(b) pilots associations;

(c) aircraft/equipment manufacturers; and

(d) competent authorities.

Note: The group should have an appropriate balance between competent authorities, operators, manufacturers and pilot associations.

The expertise and experience of the members of the group should cover the operations of TAWS, the economic impact of forward fit/retrofit of TAWS in the concerned aeroplanes and the competent authority oversight of operators.

[1] http://www.easa.europa.eu/management-board/docs/management-board-meetings/2012/01/EASA%20MB%20Decision%2001-2012%20Revised%20MB%20Decision%20RM%20Process%20.pdf

6. Annex I: Reference documents

6.1. Affected regulations

— Annex III (Part-ORO) to Commission Regulation (EU) No 965/2012 of 28 October 2012 laying down technical requirements and administrative procedures related to air operations pursuant to Commission Regulation (EU) No 216/2008 of the European Parliament and of the Council

— Annex IV (Part-CAT) to Commission Regulation (EU) No 965/2012 of 28 October 2012 laying down technical requirements and administrative procedures related to air operations pursuant to Commission Regulation (EU) No 216/2008 of the European Parliament and of the Council

— Annex VI (Part-NCC) to Commission Regulation (EU) No 965/2012 of 28 October 2012 laying down technical requirements and administrative procedures related to air operations pursuant to Commission Regulation (EU) No 216/2008 of the European Parliament and of the Council

— Annex VII (Part-NCO) to Commission Regulation (EU) No 965/2012 of 28 October 2012 laying down technical requirements and administrative procedures related to air operations pursuant to Commission Regulation (EU) No 216/2008 of the European Parliament and of the Council

— Draft Annex VIII (Part-SPO) to Commission Regulation (EU) No 965/2012 of 28 October 2012 laying down technical requirements and administrative procedures related to air operations pursuant to Commission Regulation (EU) No 216/2008 of the European Parliament and of the Council

6.2. Affected decisions

— Decision 2012/017/R of the Executive Director of the Agency of 24th October 2012 on Acceptable Means of Compliance and Guidance Material to Commission Regulation (EU) No 965/2012 of 28 October 2012 laying down technical requirements and administrative procedures related to air operations (AMC and GM to Part-ORO) pursuant to Commission Regulation (EU) No 216/2008 of the European Parliament and of the Council

— Decision 2012/018/R of the Executive Director of the Agency of 24th October 2012 on Acceptable Means of Compliance and Guidance Material to Commission Regulation (EU) No 965/2012 of 28 October 2012 laying down technical requirements and administrative procedures related to air operations (AMC and GM to Part-CAT) pursuant to Commission Regulation (EU) No 216/2008 of the European Parliament and of the Council

— Decision 2013/021/R of the Executive Director of the Agency of 23rd August 2013 on Acceptable Means of Compliance and Guidance Material to Commission Regulation (EU) No 965/2012 of 28 October 2012 laying down technical requirements and administrative procedures related to air operations (AMC and GM to Part-NCC) pursuant to Commission Regulation (EU) No 216/2008 of the European Parliament and of the Council

— Decision 2013/022/R of the Executive Director of the Agency of 23rd August 2013 on Acceptable Means of Compliance and Guidance Material to Commission Regulation (EU) No 965/2012 of 28 October 2012 laying down technical requirements and

administrative procedures related to air operations (AMC and GM to Part-NCO) pursuant to Commission Regulation (EU) No 216/2008 of the European Parliament and of the Council

— Draft Decision on Acceptable Means of Compliance and Guidance Material to Part-SPO

6.3. Reference documents

— ICAO Annex 6 Part I and II

— French BEA accident investigation report No v2-I080628

— Italian ANSV accident investigation report: Relazione d'inchiesta incidente occorso all'aeromobile Cessna 500 Citation, marche OE-FAN Punta Su Baccu Malu, Comune di Sinnai (Cagliari), 24 febbraio 2004

— Spanish CIAIAC accident investigation report No A-07/1998

— UK CAA Safety Regulation Group, Flight Operations Division Communication No 06/2007